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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/511,747 | 03/10/2005 | Ian Ralph Collins | 608-443 | 5009 |
| 23117 | 7590 | 06/14/2007 | | |
| NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203 | | | EXAMINER FIGUEROA, JOHN J | |
| | | | ART UNIT 1712 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/511,747

Applicant(s)

COLLINS ET AL.

Examiner

John J. Figueroa

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-37 and 44-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 44-48 and 52-58 is/are allowed.
- 6) ☒ Claim(s) 30-37 and 49-51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. Receipt is acknowledged of a request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e) and a submission (amendment), filed on March 14, 2007. The request has been deemed proper and this application has been hereby examined in view of said amendment.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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4. Claims 30-37 and 49-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Number (USPN) 5,089,150 to Hen, hereinafter 'Hen', in view of USPN 6,380,136 B1 to Bates et al., hereinafter 'Bates'.

Hen discloses a method of injecting a scale inhibitor formed by crosslinking a carboxylic acid-containing inhibitor (such as an alpha, beta unsaturated carboxylic acid or a polyacrylic acid having weight of 1000 to 5000), or an organophosphorous-containing inhibitor, with a polyalcohol (such as ethylene glycol, glycerol, polyvinyl alcohol or copolymers of vinyl alcohol) to provide an esterifiable crosslinked polyol-scale inhibitor, wherein the life of the scale inhibitor is extended due to the crosslinking with the polyalcohol. (Abstract; col. 2, lines 16-49; col. 3, lines 11-31 and 48-56; See, Example 1 disclosing a polyacrylic acid crosslinked with glycerol)

Hen discloses that when the inhibitor is a copolymer, the other component can be an alpha, beta-ethylenically unsaturated monomer containing olefinic, nonpolar, polar or ionic functional groups, such as styrenesulfonic acid or AMPS® (2-acrylamido-2-methylpropane sulfonic acid); wherein said scale inhibitors have a molecular weight that ranges from 200 to about 20,000. (Col. 3, line 48 to col. 4, line 5)

In Example 1, Hen discloses preparing a crosslinked polyol-scale inhibitor by a process comprising heating in a water-containing solution mixture of polyacrylic acid monomers with glycerol to form a viscous (macrogel) of cross-linked products of 22 cps to 2000 cps. A desired viscosity (suspension or solution) can be obtained depending on the duration of the heating step, temperature and choice of catalyst. (Col. 3, lines 40-47)

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Hen discloses in Example 1 injecting, into a sandstone formation at 90°C, a 2000-ppm suspension of the esterifiable cross-linked polyol-scale inhibitor in seawater, and allowing it to equilibrate overnight (percolate), subsequently followed by core back production of the well. Hen further discusses that the extended scale inhibition life, determined by its monitoring in the production phase, provides for enhanced scale inhibition of the core walls. (Col. 5, line 60 to col. 6, line 27)

However, Hen does not disclose the crosslinked polyol scale inhibitor in the form of particles.

Bates discloses a method of inhibiting scale formation comprising injecting the scale inhibitor into a formation in the form of particles in a liquid suspension/dispersion in an oil (10-50% particles by weight), shutting the well to permit "percolation," followed by the controlled release of the scale inhibitor into the formation. (Col. 1, lines 42-64; col. 10, lines 1-39; See, Examples 1 and 12)

Bates teaches that coated scale inhibitors in the form of particles significantly extends the life-time of the inhibitor thereby increasing the cost effectiveness of inhibitor treatment; and also teaches a process for preparing a dry mixture or powder of said particles by comminuting to provide scale inhibitor particles having an average size of between 0.4 and 3 microns (diameter of 400 to 3000 nm). (Abstract; col. 1, lines 41-45; col. 2, lines 35-52; col. 3, lines 1-24; col. 9, lines 41-67; Examples 1-2) The coating in the particles can be a dispersing agent to facilitate their suspension in an inert oil that is to be injected into the formation. (Col. 1, lines 46-64) The dispersing agent can be a polymer, such as a quaternized polyacrylamide. (Col. 3, line 46 to col. 4, line 8) The

particle coating may also comprise a surfactant. (Col. 4, line 62 to col. 5, line 6;

Examples 3-11)

Bates further teaches that the concentration of inhibitor present may be between 1 and 5000 ppm, preferably, between 1 and 200 ppm. (Col. 10, lines 38-39). The coating of the scale inhibitor particles in a liquid suspension/dispersion in an oil (10-50% particles by weight) allows for the controlled release of the inhibitor into the formation thereby providing a significant increase in the life of the inhibitor, a reduction in the number of treatments required and a rapid return of the well to full production. Consequently, production downtime and chemical costs are reduced. (Col. 10, lines 1-38; Example 12)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the crosslinked polyol-scale inhibitors disclosed in Hen in the form of a suspension or dispersion of coated particles. It would have been obvious to one skilled in the art to do so to attain a resultant, more cost-effective suspension of crosslinked polyol-scale inhibitors that when added to a well bore treatment fluid, provides for enhanced inhibition of corrosion within the well thereby optimizing production, as taught by Bates.

Moreover, because Hen and Bates in combination disclose the same coated crosslinked polyol-scale inhibitor particles, and suspension comprising thereof, as encompassed by the instant claims, then both sets of particles/suspensions must possess the same rate of release properties as recited in claims 54 and 55.

The limitations of claims 39 and 46 (shear rate); claim 56 (distance from well of injection); claim 57 (continuous dosage of scale inhibitor into injection water) and claim 58 (desired amount of scale inhibitor released into production) are obvious variants of Hens and Bates, in combination. Applicant has not proffered in the specification any evidence of the criticality of these features of the claimed invention that patentably distinguished it from the prior art.

Regarding the new limitation in independent claim 30 limiting the ester cross-links of the particles to be *hydrolysable* to release the scale inhibitor, because the prior art and the instant claims encompass the same esterifiable scale inhibitor particles having the same structure, then they must have the same physical/chemical properties, such as the ability to release a scale inhibitor upon hydrolysis.

Thus, the claims are unpatentable over Hen and Bates.

Allowable Subject Matter

5. Claims 44-48 and 52-58 are allowed.

The prior art does not teach or suggest the process recited in independent claim 44 for preparing particles of an esterifiable scale inhibitor cross-linked with a polyol via ester-cross-links comprising heating a polyol, an esterifiable inhibitor and a strong catalyst under low shear conditions to form a macrogel; drying said macrogel to form a solid; and comminuting the solid to provide particles of esterifiable scale inhibitor cross-linked with a polyol having a mean particle size diameter of less than one micron.

Nor does the prior art teach or suggest the method of inhibiting scale formation recited in independent claim 52 comprising injecting a suspension of scale inhibitor particles, having a mean diameter of less than one micron, through an injection well in to a subterranean formation; allowing said suspension to percolate in the formation; and controllably releasing the scale inhibitor from the particles in the near well bore region of the production well.

Response to Arguments

6. Applicant's arguments regarding Hen and Bates not teaching the new limitation regarding the particles releasing a scale inhibitor upon hydrolysis was addressed above in paragraph #4.

Conclusion

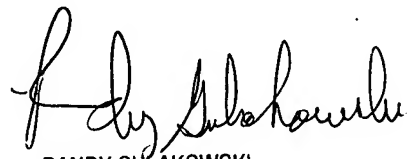
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Mon-Thurs & alt. Fri 8:00-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JJF/RAG



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